UNIVERSITY OF TORONTO
DEC
1891

JOHNS HOPKINS UNIVERSITY CIRCULARS

Published with the approbation of the Board of Trustees

Vol. XI.—No. 93.] BALTIMORE, NOVEMBER, 1891. [Price, 10 Cents.

THE SEVENTIETH BIRTHDAY OF PROFESSOR VIRCHOW.

CELEBRATION IN THE JOHNS HOPKINS UNIVERSITY.

In response to an invitation of the President and Medical Professors of the Johns Hopkins University a company, composed of the staff of the University and Hospital and of the leading physicians of Baltimore, met in the lecture room of the Physical Laboratory on Tuesday evening, October thirteenth, to celebrate the seventieth birthday of Professor Virchow. In the unavoidable absence of the President of the University, Professor Ira Remsen, M. D., Ph. D., was called to the chair. He made a short address, in the course of which he read the following letter:—

From President Gilman to Professor Remsen.

I am extremely sorry that an engagement made several months ago to visit at this time the University of North Carolina will prevent my being present at the celebration of the seventieth birthday of the great Professor Virchow. The Medical Professors desire that you should take the chair on that occasion, and I certainly hope that you will consent to do so.

It will assuredly gratify all the members of the University that the Faculty of Medicine, and especially those members of it who have come under the influence or instruction of the distinguished pathologist, have thought of this mode of showing their admiration for his genius and their respect for his long and honorable career. The speakers that have been selected will do full justice to the scientific work of this great leader. They understand it, they appreciate it, and they will make it clear to their non-professional hearers that Virchow is not only one of the great discoverers of the nineteenth century but one of the great benefactors of our race.

I hope it will not appear intrusive if I express the hope that the merits of Professor Virchow as a citizen will be commemorated as well as his powers of research and investigation. The wide range of his scientific activity has not prevented him from participating in political, educational, and social duties. To the best of his ability he has served the public with all the talents that he possessed. He has shown us all that the highest devotion to science is quite compatible with endeavors to advance the intelligence, the health, the prosperity and the order of society. So his long life is a good example not only to pathologists, physiologists and physicians, but to scholars in every branch of science.

Baltimore, October 12, 1891.

The following addresses were then delivered:

I.

VIRCHOW, THE MAN AND THE STUDENT.

By William Osler, M. D., F. R. C. P.
Professor of Medicine in the Johns Hopkins University.

By his commission the physician is sent to the sick, and knowing in his calling neither Jew nor Gentile, bond or free, perhaps he alone rises superior to those differences which separate and make us dwell apart, too often oblivious to the common hopes and common frailties which should bind us together as a race. In his professional relations, though divided by national lines, there remains the feeling that he belongs to a Guild which owes no local allegiance, which has neither king nor country, but whose work is in the world. The Æsculapian temple has given place to the hospital, and the priestly character of the physician has vanished with the ages; still there is left with us a strong feeling of brotherhood, a sense of unity, which the limitations of language, race and country have not been able to efface. So it has seemed meet and right to gather here this evening to do honor to a man—not of this country, not of our blood—whose life has been spent in the highest interests of humanity, whose special work has revolutionized the science of medicine, whose genius has shed lustre upon our craft.

The century now drawing to a close has seen the realization of much that the wise of old longed for, much of which the earnest spirits of the past had dreamt. It has been a century of release—a time of the loosening of bands and bonds; and medicine, too, after a long enslavement, ecclesiastical and philosophical, received its emancipation. Forsaking the traditions of the elders, and scouting the Shibboleth of schools and sects, she has at last put off the garments of her pride, and with the reed of humility in her hand sits at the feet of her mistress, the new science. Not to any one man can this revolution be ascribed; the *Zeit-geist* was potent, and like a leaven worked even in unwilling minds; but no physician of our time has done more to promote the change, or by his individual efforts to win his generation to accept it, than Rudolph Virchow.

And now, as the shadows lengthen, and ere the twilight deepens, it has seemed right to his many pupils and friends, the world over, to show their love by a gathering in his honor, on this his seventieth birthday. To-day, in Berlin, a *Fest* has been held, in which several hundred members of the profession in this and other countries have been participants, as subscribers to the fund which was organized for the occasion. It seemed well, also, to his pupils who are teachers in this university, and to others, that the event should be marked by a reunion at which we could tell over the story of his life, rejoice in his career, and express the gratitude which we on this side of the Atlantic feel to the great German physician.

Let me first lay before you a brief outline of his life:

Rudolph Virchow was born October 13, 1821, at Schivelbein, a small town in Pomerania. Details of his family and of his childhood, which would be so interesting to us, are not available. Educated at the Gymnasium in Berlin, he left it at Easter, 1839, to begin his medical studies, and graduated from the University of that City in 1843. The following year has become assistant in pathological anatomy to Froriep; and in 1846 he was made prosector, and in 1847 a lecturer at the university. In 1849, on account of his active participation in the political events of the previous year he was dismissed from his university positions, and as he mentions was only *mit grossen beschränkungen* reinstated, largely in fact by the efforts by the profession of Berlin, and particularly of the medical societies. In August, 1849, he received a call to the chair of pathological anatomy at Wurzburg, a position which he held until 1856, when, by the unanimous vote of the faculty, he was recommended for, and received the appointment which he still holds, namely, professor of pathological anatomy at Berlin. Prior to leaving Berlin he founded, in 1847, his celebrated *Archiv*, now in its one hundred and twenty-eighth volume, which is the greatest storehouse of facts in scientific medicine possessed by us to-day.

Externally, at least, an uneventful, quiet, peaceable life with few changes. As an illustration of the successful pursuit of various callings, Virchow's career is without parallel in our profession, and this many-sidedness adds greatly to the interest of his life. Dr. Welch will speak of his special labors in the science of pathology; and other aspects will be considered by Dr. Chew and Dr. Friedenwald. I propose to indicate briefly a few traits in his life as a man of science and as a citizen.

From the days of the great Stageirite, who, if he never practised medicine, was at least an asclepiad and an anatomist, the intimate relation of medicine with science, has in no way been better shown than in the long array of physicians who have become distinguished in biological studies. Until the gradual differentiation of subjects, necessitated by the rapid growth of knowledge, the physician, as a matter of course, was a naturalist; and in the present era, from Galen to Huxley, the brightest minds of the profession in all countries, have turned towards science as a recreation or as a pursuit. Alas! that in the present generation, with its strong bent toward specialism, this combination seems more and more impossible. We miss now the quickening spirit and the wiser insight that come with work in a wide field; and in the great cities of this country we look in vain among practising physicians for the successors of Jacob Bigelow of Boston, Holmes of Montreal, Barton of Philadelphia, and others—men who maintained in this matter an honorable tradition, whose names live in natural history societies and academies of natural science, in the founding of which they were mainly instrumental.

In anthropology and archæology the name of Rudolph Virchow is almost as well known as it is in medicine. Very early in his work we find evidences of this bent in the memorable studies, now forty years ago, on Cretins and on the development of the skull. Not a year has passed since that time without some notable contribution from him on these subjects; and those of us who know only his professional side may well marvel at the industry of the man whose name is quoted and appears in anthropological memoirs and journals as often as in our technical works. In recognition of his remarkable labors in this department, a special anthropological institute was organized in 1881, on the occasion of the twenty-fifth year of his professoriate. In 1884, on returning to Berlin for the first time since my student days, I took with me four choice examples of skulls of British Columbian Indians, knowing well how acceptable they would be. In his room at the Pathological Institute, surrounded by crania and skeletons, and directing his celebrated *diener*, who was mending Trojan pottery, I found the professor noting the peculiarities of a set of bones which he had just received from Madeira. Not the warm thanks, nor the cheerful, friendly greeting which he always had for an old student, pleased me half so much as the prompt and decisive identification of the skulls which I had brought, and his rapid sketch of the cranial characters of the North American Indian. The profound expert, not the dilettanté student, has characterized all of his work in this line. Even an enumeration with a brief report of his published writings in anthropological and archæological subjects would take more time than has been allotted to me. Of his relations with Schliemann I must say something, which I could not do so well as in the words used by his friend, Dr. Jacobi, ten years ago: "Schliemann, by whose modern witchcraft holy old Troy is just leaving its tomb, invited Virchow to aid him in his work of discovery of the buried city. He went—partly to aid, partly, as he says, to escape from overwhelming labors at home—only to be engrossed in just as hard work, though of a different nature. In regard to the latter, Schliemann's recent book on 'Ilios' contains some very interesting material. But what has engaged my attention and interest most has been to observe the humanity and indefatigability displayed by the great man in the service of the poor and sick. To read of his constant, practical exertions in behalf of the miserable population of Hissarlik; how he taught the aborigines the efficacy of chamomile and juniper, which grow about them, unnoticed and unused, in rare abundance; how a spring he laid open for archæological purposes has been called by them 'the physician's' and is believed to have beneficial effects; how he was, on leaving the neighborhood, loaded with flowers, the only thing they had and knew would please him, has charmed me intensely. To admire a great man for his professional labors, eagerly undertaken and successfully carried out is a great satisfaction to the scientific observer; to be able to love him, in addition, for his philanthropy and warm-heartedness, is a feast of the soul."

Virchow's life-work has been the study of the processes of disease, and in the profession we revere him as the greatest master that has appeared among us since John Hunter. There is another aspect of his work which has been memorable for good to his native city. From the day when, as a young man of twenty-seven, he was sent by the Prussian government to Upper Silesia to study the typhus epidemic, then raging among the half-starved population, he has been one of the most powerful advocates in Germany for sanitary reform; and it is not too much to say that it is largely to his efforts that the city of Berlin owes its magnificent system of drainage. His work in this department has been simply monumental, and characterized by the thoroughness which marks the specialist.

To his exhaustive monographs on camp-diseases, cholera, military medicine, and other cognate subjects, I cannot even refer.

It will be generally acknowledged that in this country doctors are, as a rule, bad citizens, taking little or no interest in civic, state or national politics. Let me detain you a moment or two longer to tell of one of us, at least, who, in the midst of absorbing pursuits, has found time to serve his city and his country. For more than twenty years Virchow has sat in the Berlin City Council as an alderman, and to no feature in his extraordinary life does the Berliner point with more justifiable pride. It is a combination of qualities only too rare, when the learned professor can leave his laboratory and take his share in practical, municipal work. How much his colleagues have appreciated his efforts has been shown by his election as Vice-President of the Board; and on the occasion of the celebration in 1881, the *Rathhaus* was not only placed at the disposal of the committee, but the expenses of the decorations, etc., were met by the council; and to-day comes word by cable that he has been presented with the freedom of the city.

The years succeeding to Virchow's student days were full of strong political feeling, and with the French Revolution in 1848, came a general awakening. In Germany the struggle for representative government attracted many of the ardent spirits of our profession, and it was then that Virchow began his political career. The revolution was a failure, and brought nothing to the young prosector but dismissal from his public positions. His participation might have been condoned had he not issued a medico-political journal, *Die Medicinische Reform*, the numbers of which are even now very interesting reading, and contain ideas which to-day would be called liberal, but were then revolutionary. It is a striking evidence of the deep impression which even at that time Virchow has made upon his colleagues and the profession, that he was reinstated in his office at the urgent solicitation of the medical societies of the city. He relates in his "*Gedächtnissrede auf Schönlein*," who was the Court physician and not at all in harmony with the views of his prosector, that on one occasion in 1848, at a post-mortem, in which the diagnosis of hæmorrhage into the brain had been made by the professor, Virchow demonstrated an obstructing embolus in the artery. Schönlein turned to him in a half-vexed, half-joking manner and said, "Sie sehen auch ueberall Barrikaden." His active political life dates from 1862, when he was elected to the lower house from one of the Berlin districts, and has, I believe, sat as member almost continuously from that date. The conditions in Germany have not been favorable to a man of advanced liberal views, and Virchow has been attached to a party which has not been conspicuously successful; but he has been an honest and industrious worker, a supporter of all measures for the relief of the people, a strenuous opponent of all class and repressive legislation, and above all an implacable enemy of absolutism as personified in Bismarck. A man of such strong individuality would make his presence felt in any assembly; and he always commanded the attention of his colleagues, and oftentimes his speeches have been reported fully both in England and in America.

As an illustration of his capacity for varied work, I recall one day in 1884, in which he gave the morning demonstration and lecture at the Pathological Institute, addressed the Town Council at great length on the extension of the canalization scheme, and made a Budget speech in the House, both of which were reported at great length in the papers of the next day.

Naturally, amid such diverse occupations, it has been impossible for him to enter with his old vigor into the minutiæ of pathological anatomy, and his attitude of late years has been critical rather than productive; but his interest in all that pertains to our profession is unabated, and in a feature of his character to which I must allude. Too often with us, in our gatherings and society meetings, the "men of rathe and riper years" are conspicuous by their absence. In this respect our great master has set a notable example. Amid cares and worries, social and political, with a thousand and one ties and duties, he has never held aloof from his brethren; but as the weekly medical journals testify, no man in Berlin has been more active, and for years he has held the Presidency of the Berliner Medicinische Gesellschaft, one of the most important medical societies of Europe.

Surely the contemplation of a life so noble in its aims, so notable in its achievements, so varied in its pursuits, may well fill us with admiration for the man and with pride that he is a member of our profession. The influence of his work has been deep and far-reaching, and in one way or another has been felt by each one of us. It is well to acknowledge the debt which we every-day practitioners owe to the great leaders and workers in the scientific branches of our art. We dwell too much in corners, and, consumed with the petty cares of a bread-and-butter struggle, forget that outside of our routine lie Elysian fields into which we may never have wandered, the tillage of which is not done by our hands, but the fruits of which we of the profession (and you of the public) fully and freely enjoy. The lesson which should sink deepest into our hearts is the answer which a life, such as Virchow's, gives to those who to-day, as in past generations, see only pills and potions in the profession of medicine, and who, utilizing the gains of science, fail to appreciate the dignity and the worth of the methods by which they are attained. As Pausanias pestered Empedocles, even to the end, for the details of the cure of Pantheia, so there are with us still those who, "asking not wisdom, but drugs to charm with," are impatient at the slow progress of science, forgetting that the chaos from which order is now appearing has been in great part dispelled by the work of one still living—by the man whom to-night we delight to honor.

II.

VIRCHOW, THE PATHOLOGIST.

By William H. Welch, M. D.,

Professor of Pathology in the Johns Hopkins University.

It is fitting that of Virchow's manifold activities that side which represents nearly fifty years of academic work should be a special theme upon this occasion. My contribution, therefore, will relate only to Virchow, the pathologist, the broad view of his career and work in other departments having already been presented to you.

It is as an investigator and teacher of pathology that Virchow ranks as one of the great reformers in medicine.

To appreciate the character and extent of an advance made by scientific discovery, it is necessary to know something about the ideas which have been displaced or overthrown by the discovery. The younger generation of students are in danger of forgetting that facts which are taught to them and which seem to them the simplest and most natural, may have cost years of patient investigation and hard controversy, and possibly have taken the place of doctrines, very different or even contradictory, which long held sway, and which seemed to other generations equally simple and natural. If then, we wish to understand the nature and extent of the reforms in pathology, which we owe to Virchow, we must consider the conditions in which he found medicine, and more particularly pathology, in the fourth decade of this century, when he began his scientific work.

At that period medicine in one country was much less influenced by its condition in other countries than is the case at the present time. Medical journals and other means of interchange of ideas were fewer then than now. Medicine was more distinctly national, less cosmopolitan, than it is to-day.

France unquestionably held the leading position in medicine during the early part of this century. The first three decades mark the most splendid period of French medicine. At the very beginning of the century Bichat laid the foundations of general anatomy by his studies of the tissues. He opened the way for the study and classification of morbid changes according to the tissues affected. This is in some respects the most important contribution to pathological anatomy from the time of Morgagni to that of Virchow. Morgagni showed that the purpose of pathological anatomy is not simply the collection of curious and interesting cases, but is to teach us the seats of disease as is indicated by the title of his great work, "De Sedibus et Causis Morborum per Anatomen Indagatis." He, however, was not able to trace the seats of disease further than to the organs affected. Bichat took a long step forward when he substituted the tissues composing the organs, as the seats of morbid changes, and in this particular direction no distinct advance in pathological anatomy was made for fifty years, when Virchow taught us to go still further back than the tissues, to seek in the cells the seat of disease.

But so far as the gross appearances of diseased organs and tissues are concerned, pathological anatomy was most enthusiastically cultivated in France, and this, together with the development of the methods of physical diagnosis by percussion and auscultation, was made the basis of a new clinical medicine by such men as Corvisart, Lænnec, Bayle, Piorry, Louis, Andral. The sound and healthy traditions of this French clinical medicine of the first third of the century, have been continued to the present day, and were early brought to our own country by distinguished pupils of Louis and Trousseau. But the studies in pathological anatomy were fruitful only in certain directions, mainly in diseases of the heart and lungs, and in the elucidation of typhoid fever. They were pursued by clinicians chiefly as a basis of clinical diagnosis. False and exaggerated ideas as to the kind of knowledge to be derived from pathological anatomy, led to the establishment of unfounded systems of medical doctrine, such as that of Broussais, regarding irritation and gastro enteritis, so fatal in its practical consequences. The use of the microscope was even decried by some of the leading pathological anatomists, and when employed led to little of any value. Pathological histology did not exist. Experimental physiology was developed, one can almost say, was originated, by Magendie, but the importance of experiment and clinical observation for the development of pathological physiology, was not generally recognized.

In Great Britain there existed the fructifying influence of the name and teachings of that great investigator in pathology, John Hunter. In some respects Virchow is to be regarded as the immediate successor of John Hunter in the history of pathology, although his work began fifty years after Hunter's death. Both men discarded philosophical speculation and went back to nature, to observation, to experiment for facts on which to build their doctrines. Both made use of all allied sciences at their disposal, of anatomy in the broadest sense, of physiology, in their investigations, but of course much more was available for the later investigator. Both kept constantly in view the problems of practical medicine, together with the broadest interests and direct participation in science. Both recognized pathological physiology as the foundation of scientific medicine and that this is to be constructed not from anatomical investigations alone, but with the aid of physiology, of experiment and of clinical observation. Hunter was the first to give a broad scientific basis to surgery. Virchow took up many problems just where Hunter had left them. The time had come when he could build deeper and stronger and broader on the foundations of scientific medicine.

In the year of John Hunter's death, his nephew, Matthew Baillie, published his work on "Morbid Anatomy," which is the first one based upon independent systematic observations. The plain, purely objective descriptions, free from the prevailing tendency towards unwarranted generalizations, have given a permanent value to this work. Sound observations continued to be made by such men as Abernethy, the Bells, Abercrombie, Cooper, Howship, Monro, Addison, Gulliver, Bright, Hope, Carswell, but much as they enriched the storehouse of pathological anatomy, the fundamental principles of pathology remained the same, although commendably free from many of the speculative tendencies of the Continent.

It was in the third and fourth decades that the great Vienna school of pathology came to the front under Rokitansky and Skoda. As a purely descriptive pathological anatomist, Rokitansky is the greatest who ever lived. The General Hospital of Vienna afforded him an enormous material for observation. When he retired from his professorship at the age of seventy years, he is said to have possessed over 100,000 protocols of autopsies made by himself or his assistants. The industry, acuteness of observation and purposeful character of his work are marvellous. His descriptions of the gross appearances of diseased conditions serve now and will probably continue to serve for a long time as models of clearness, accuracy, conciseness and vividness. As Virchow has said, he is for pathology what Linnæus is for botany. But in the interpretation of the morbid changes which he described so objectively and in the deduction of general pathological principles, Rokitansky was singularly unfortunate. His attempt to construct out of pathological anatomy a general pathology or pathological physiology, is a lamentable failure in the first edition of his great work on Pathological Anatomy. Bound in the trammels of humoral pathology, he elaborated his doctrine of crases which was at first received so enthusiastically by his followers. It is fair to say that no one was more open to conviction by facts than Rokitansky, and that he threw overboard his whole complicated system of crases after the destructive criticism which it received from Virchow. It was mainly by the teachings of Rokitansky and of his pupil, the great clinician, Skoda, that the nihilistic school of therapeutics developed and dominated for so many years the Vienna school of medicine. With their attention fixed continually upon the post-mortem table and the gross anatomical changes produced by disease, these observers could not comprehend how such changes are amenable to treatment, and they fell into the error of those who make pathological anatomy the exclusive basis of clinical medicine. Those who do this forget that the changes found in the dead organ give only partial, although valuable, information as to the process of disease in the living organ, as to remote effects upon other parts of the body, as to causes of disease, as to disturbances of function.

In Germany proper, medicine presented in the early part of this century a less edifying spectacle than in the other countries mentioned. Although in this period work of fundamental importance was done in allied sciences, such as comparative anatomy and embryology, medicine presented a succession of systems and schools of doctrine founded largely on speculation. The minds of physicians were possessed by such doctrines as those of vitalism, Brownianism, of the philosophy of nature. Here and there a good observer in pathological anatomy such as J. F. Meckel and Lobstein or an enlightened physician stands out in contrast to the dominant speculations, hypotheses and mysticism. The controversy, centuries old, as to whether disease affects primarily the solids or the fluids was still kept up with fruitless dialectics. A healthier direction was given to clinical medicine by the teachings of Schönlein, but he did not break with the prevailing ontological conception of disease as an entity, as something apart which enters the body and lives there like a parasite Medical works published in Germany as late as the fourth decade of this century are still full of such terms as 'natur-philosophische, natur-historische, rationelle, physiologische" systems of medicine, to say nothing of the ultramontane, theological system of the professor of medicine in Munich.

In the third decade discoveries in microscopical anatomy were made, surpassing in number and importance all which had come before, and forming the basis of modern histology. In Johannes Müller's work "On the Intimate Structure and the Forms of Morbid Tumors" published in 1838, we meet the first fruitful application of the microscope to the study of pathological anatomy, and this work may be regarded as the beginning of pathological histology in the modern sense. In the same year Schwann promulgated the cell theory as applied to animals. The fundamental error of Schwann as to the origin of the cells by spontaneous generation out of a primitive blastema exerted, for many years, an unfortunate influence upon pathology and led many a good investigator to spend his force in a will-o'-the-wisp search for the development of cells out of unformed material. The blastema theory for a time dominated pathology. The plastic substances of John Hunter, various pathological exudates were resolved to a large extent into blastemata and the problems which seemed most urgent were to determine the characters of these blastemata, their metamorphoses and the exact mode of formation of cells out of them; and to these delusive problems microscopists set themselves to work.

Surrounded by such ideas in the year 1844, one year after his promotion to the doctor's degree, Virchow began his work first as assistant and then as prosector in the Charité Hospital in Berlin. He must have received more inspiration from Johannes Müller, the greatest physiologist of the first half of this century in Germany, than from any other of his teachers, but he has acknowledged his indebtedness also to Schönlein, that remarkable man, who, without having ever published half-a-dozen pages after his graduating dissertation, became the most popular, influential and inspiring clinical teacher in Germany. Doubtless many an impulse must have come from association with that company of ardent young investigators in medicine assembled in Berlin in the early forties, from such men as Franz Simon, Reinhardt, Leubuscher, Joseph Meyer, Remak, Traube, DuBois-Reymond, Brücke, Helmholtz. The spirit of reform was no less in the medical than in the social and political atmosphere of the time. All of these influences of his teachers, of his co-workers, of the "Zeitgeist" must have had their effect upon the young man, but from the beginning, Virchow's published work marked him as an original and independent genius.

In 1846, at the age of twenty-five, Virchow read before the Society for Scientific Medicine in Berlin the paper entitled "Concerning Points of View in Scientific Medicine," which was soon after published as the leading article in the first volume of the *Archive for Pathological Anatomy and Physiology and for Clinical Medicine* founded by himself and Reinhardt. This short article is in a sense the programme of the author and of the journal in which it appeared. Here is emphasized the idea that disease is not an independent being, but is life under changed conditions. Scientific medicine is the investigation of these changed conditions and of the means of removing them. Halt is called to dogmatism and speculative systems of medicine. The limits of pathological anatomy are determined. The methods of investigation and the assistance of other natural sciences must be employed in medicine. Progress can come only by experiment and observation. The immediate task is to discard philosophical systems and to set to work in collecting facts. Permit me to quote the last paragraph of this remarkable article:

"Let us not deceive ourselves about the condition of medicine. Minds are unmistakably exhausted by the many hypothetical systems again and again cast aside only to be replaced by new ones. A few more invasions perhaps and this time of unrest will have passed by and it will be recognized that only quiet, industrious and persevering work, the true work of observation or experiment, possesses enduring value. Pathological physiology will then gradually be developed, not as the production of a few heated brains, but as the work of many patient investigators; that pathological physiology, which is the citadel of scientific medicine, of which pathological anatomy and the clinic are only out-works."

Brave words and true are these uttered by a young physician only three years after receiving his doctor's degree, words significant now, but many times more significant when they were spoken. But they were not the words of a dreamer or an idle talker. He who wrote them had already begun that "quiet, industrious and persevering work, the true work of observation and experiment," which was destined to introduce a new epoch in the history of medicine.

By a fortunate chance Robert Froriep assigned to his young assistant as a theme for independent investigation, the study of phlebitis. It would lead too far into historical detail for me to attempt to explain the position which phlebitis then occupied in pathology. Some idea may be gathered from Cruveilhier's sentence, *La phlébite domine toute la pathologie.* So firmly established at that time was Cruveilhier's doctrine that the essence of inflammation is coagulation of the blood in the veins and capillaries, that it seemed necessary to work out only certain details, such as, whether or not in suppurative phlebitis the pus is secreted by the wall of the vein. But it at once became clear to Virchow that the general doctrine rested upon no sure foundations and it was upon the foundations of the doctrine that he began to work. His preliminary studies were upon the morphology and chemistry of fibrin and the conditions for its coagulation both within and outside of the body. At the same time his attention was turned to the morphological elements of the blood, more particularly the white blood corpuscles, and here his observations on leukæmia opened new points of view on the nature and origin of the white corpuscles, so that in 1846, he could say, "Herewith I vindicate for the colorless corpuscles of the blood a place in pathology." His powers of critical analysis and correct interpretation of pathological facts were at this time brilliantly exhibited in the view which he took as to the nature of leukæmia, the same view essentially which is still held, in contrast to Bennett's conception of the disease as an hæmitis, a suppuration of the blood. But it was in the epoch-making articles on "Plugging of the Pulmonary Artery and its Results" (1846 and 1847) and on "Acute Inflammation of the Arteries" (1847), that the best fruits of Virchow's studies of subjects suggested by phlebitis appeared. Here, for the first time, was there a clear insight into an important group of pathological facts which had been the favorite study of John Hunter and which had exercised the minds of the succeeding generation of pathologists. The doctrine of thrombosis and embolism as it was here and subsequently elaborated by Virchow formed virtually a new chapter in pathology, well rounded as it left the hands of its founder, a monument of brilliant scientific investigation in pathological anatomy and experimental pathology. The important articles on "Pathological Pigments," and "The Pathological Physiology of the Blood" belong also to the same period and the same line of investigation. The fundamental part of these researches, together with investigations in many other directions in pathology, belong to the first Berlin period of Virchow's activity (1844-1849).

The Würzburg period, extending to 1856, was one of great and fruitful scientific work. Already in Berlin, by his investigation of degenerative cellular changes in Bright's disease and of inflammation of muscle, Virchow had reached new views as to the nutritive alterations of cells in inflammation; but it was in Würzburg especially that his doctrine of inflammation, which has exerted such a reformatory influence upon pathology, was worked out by himself and his pupils. In the article on "Parenchymatous Inflammation" (1852), and in that of the same year on "Units of Nutrition and Localizations of Disease," he has already conquered a large tract of cellular pathology. He has a firm grasp upon the nutritive and functional disturbances of cells. Further researches were necessary to reveal clearly their formative activities In the light of the most recent views concerning inflammation, it is significant to note that in the first of these articles Virchow clearly recognizes suppuration as secondary to necrosis of tissue, and in this connection says, "Here there is certainly an inner, parenchymatous process, and if the subsequent suppuration be regarded as the outcome of inflammation, one need not hesitate to regard the degeneration of the parenchyma as an integral, neither consecutive nor accidental, part of the inflammatory process." And again at the close of the article, "not hyperaemia and not exudation, nor redness, nor swelling, nor pain, do I put first, although I recognize their importance, but degeneration—I vindicate, therefore, before all for inflammation the character of degeneration."

But the brightest lustre of this period of Virchow's scientific work comes from those investigations which laid the foundations of cellular pathology. Like all of his contemporaries, Virchow at the beginning was under the dominion of Schwann's theory as to the spontaneous origin of cells from blastema. His researches upon the origin and structure of the connective-tissue group of substances, published in 1850, were reformatory for both pathological and normal histology. There followed a series of investigations which laid broad and firm the foundations of cellular pathology. Already in 1854 Virchow cast aside definitely the blastema theory of cell formation.

To describe further in detail these and the other investigations of Virchow in pathology up to the present time is impossible within the limits of an address. To do this would require a book covering nearly the whole ground of pathology. Into what corner of special pathological anatomy and of general pathology should we not be led if we attempted to follow the many hundred articles which he has written on these subjects? We cannot include here the consideration even of such a monumental work as that which he has written upon tumors. And still no adequate estimate of Virchow's work as a pathologist can be reached without a consideration of his detailed investigations, for it is especially characteristic of him that he has combined with the highest aims, with the establishment of the most far-reaching general principles, with the most comprehensive researches, the study of matters apparently very minute and of narrow import. He has shown no less energy in the pursuit of these small details than in that of the widest and most fundamental questions.

I must content myself in the limited time remaining by directing your attention to a few salient points intended especially to show the reformatory character of Virchow's work in pathology.

In his beautiful oration on Johannes Müller, Virchow says, "There is no school of Müller in the sense of dogmas, for he taught none, but only in the sense of methods." The same may be said of Virchow's school. His school means not the propaganda of certain dogmas as meant the schools of the great leaders of medicine of olden times. It is the method and not dogma which characterizes it, and the method is that of the natural and physical sciences. In 1849, in the article on "The Scientific Method and Points of View in Therapeutics," Virchow wrote: "In fact, that is true which Asclepiades of Bithynia, the father of that old school of methodistic physicians, emphasized; the method of investigation is that which is essential and determining. It is the method which distinguishes the Harveys, the Hallers, the Bells, the Magendies, and the Müllers from their smaller contemporaries. This is the soul of the natural sciences."

Observe; experiment; seek the aid of allied sciences, chemistry, physics, general biology; collect by systematic and purposeful investigation, in which the "Frage-Stellung" is correct and clear, a body of facts, and from them deduce general pathological principles and laws. It is along these lines that Virchow has worked and taught. The proper uses of hypotheses in scientific investigation he has always recognized; but important as are these uses, hypotheses are not to serve as the foundation of pathological doctrines. His early opponents, the adherents of the philosophy of nature and the so-called rationalists, accused him of leading medical science into the barren collection of facts, of letting the broad river of science waste itself in countless little streams. But both by precept and example no one has demonstrated more clearly than Virchow that the scientific mind, in the investigation of details, should not lose sight of the higher aims, the orderly classification of the facts, the search after new and loftier points of view, the establishment of general principles and laws.

This method of investigation is none other than the Baconian. Virchow did not originate it. Many before him had recognized its importance, and had applied it to medicine. Before Virchow it had already become the powerful lever of comparative anatomy, embryology and physiology. But one purpose of the historical remarks with which I began this address was to show that in pathology this method had not gained full sway when Virchow's work began, and that speculation and the construction of philosophical systems of medicine based upon speculation, were still in vogue. The application of the scientific method to pathology could not have been long delayed, but to Virchow more than to any other man belongs the credit of introducing into pathology the scientific method of investigation by the employment of which this department of knowledge has been lifted out of the ban of dogmas and subjection to authorities and has gained its rank as one of the natural sciences.

It is another great merit of Virchow to have made clear the kind of knowledge to be gained by the study of pathological anatomy. In the enthusiasm of the rapid development of pathological anatomy in the early part of this century, false and exaggerated ideas were entertained as to the relations between this subject and practical medicine and as to the kind of information to be derived from the examination of diseased organs after death. The attempt was made to construct out of pathological anatomy alone, systems of pathological physiology. This led in France to such exclusive systems as Broussaisism and in Vienna to the craseological system of Rokitansky and to the nihilistic school of therapeutics, less dangerous than Broussaisism but equally unfounded. Rokitansky expressed and enforced upon his followers "the conviction," to quote his own words, "that pathological anatomy must be the foundation not only of medical knowledge but also of medical treatment, yes, that it contains everything that there is in medicine of positive knowledge and of foundations for such knowledge." Against this view Virchow pointed out that each department of medicine has its own field and must be investigated by itself and cannot be constructed entirely out of another. As he said, "Pathology cannot be constructed by physiologists, therapeutics not by pathological anatomists, medicine not by rationalists."

Pathological anatomy shows us simply the morbid changes in the organs, tissues and cells as they exist in one phase or in a series of phases. It does not show us the morbid process as it goes on in time. It does not reveal the alterations in function. Pathological anatomy is essential to pathological physiology, but the relations which these branches of knowledge bear to each other are similar to those between normal anatomy and physiology. General pathology or pathological physiology, as Virchow likes to call it, rests also upon experiment and clinical observations. It never has been and never can be successfully built up from pathological anatomy alone. Its methods are those of normal physiology. In one of his earliest publications in 1846, Virchow said: "It would be sad indeed if anatomical investigation were compelled to confine itself to the dead material, to the recognition of the completed conditions of isolated and determined products, if the entire outcome were only the description and classification of certain objects in nature. Pathological experiment remains ever the sure control for the pathological anatomical conclusion, and it will seldom be employed without disclosing to us new and valuable sources of knowledge." These words appropriately introduced the description of Virchow's admirable anatomical and experimental work on "Plugging of the Pulmonary Artery and its Results." All this needed to be said when Virchow said it, and it has not lost its force to-day

John Hunter and Magendie were the pioneers in experimental pathology, and Virchow and Traube established pathological experiment in its impregnable position as the most powerful aid in the development of pathological physiology.

The establishment of cellular pathology is one of the greatest events in the history of medicine. That Virchow's share in this was decisive and controlling cannot be successfully contested. The historical points pertaining to the development of the principles of cellular pathology have been often and much discussed. Virchow's investigations leading to the development of this great thought in his mind are briefly referred to in chronological sequence in the article at the beginning of the one hundredth volume of his *Archiv*. On this occasion I cannot enter into the history of the question, save to emphasize one point which is lost sight of by some of those who have written on the matter. The discoverer of a scientific fact is not he who has divined it, but he who has proved it. The opportunities for the study of the development of animal cells are furnished chiefly by embryology and by pathology. The demonstration that all cells are derived from pre-existing cells was easier to bring by the embryologist, starting with the ovum, a single cell, than by the pathologist. Hence it is not strange that embryologists, such as Reichert, Kölliker and later Remak, had discarded the blastema theory, so far as the development of the embryo is concerned, at a period when the same theory prevailed in pathology. But so long as it was not proven that in pathological formations the new cells also come from pre-existing cells, this general principle of cell development could not be considered proven. It was not until Virchow had brought this part of the evidence, more difficult to obtain than the embryological and equally important, that the truth, which he was the first to frame in the words, *omnis cellula e cellula*, was fully established. The nutritive, the functional and the formative disturbances of cells became in his hands the groundwork of cellular pathology; and although this ground-work was laid before the publication of his "Lectures on Cellular Pathology," in 1858, nevertheless these came as a revelation to most physicians throughout the world.

The principles of cellular pathology have become to such an extent an integral part of medical thought that we can hardly estimate to-day all that this discovery meant a generation ago. To do this we must put ourselves back in thought to a time when all organized pathological products, pus, tubercle, cancer and all tumors were supposed to be formed out of a primitive blastema, an exudation of some kind. Think of trying to come, under the influence of such ideas, to any coherent or intelligent opinions as to the nature and development of morbid processes.

The never-ending strife between humoralism and solidism would probably be going on to-day had it not received its death-blow from cellular pathology. The termination of this strife does not mean that we are not the heirs of great truths which came out of it, or that there is any contradiction between cellular pathology and humoral or nerve pathology in the proper sense of the terms. In 1855 Virchow said, with a cast of thought perhaps derived from his political opinions: "While we contend for the *Tiers-état* of the many little elements, it may seem as if the aristocracy and the hierarchy of blood and nerve were to be destroyed to their very roots. But it is here only usurpation which we attack, monopoly which we wish to overthrow; and once again we emphasize it that we fully recognize blood and nerve as equally authorized factors together with the other parts; yes, that we do not in the least question their predominant importance, but that we concede their influence upon other parts to be only a stimulating and moderating, not an absolute, one."

With the recognition of cellular pathology, it became clearer than ever before that the laws working in disease are not different from those in operation in health, but that they are subject to different conditions. The ontological conception of disease passed out of the horizon of scientific medicine.

Cellular pathology is not a system, a doctrine; it is a biological principle, as has been said by its founder. Its foundations have been attacked, but never have been shaken. The discoveries of wandering cells, of the migration of leucocytes from the vessels, of karyokinesis, and of the specific cellular germs of disease have only widened our views in cell pathology. Especially have the studies of karyokinesis been a brilliant addition to our knowledge of cell life. Greatly mistaken are those who imagine that the discoveries concerning the relations of micro-organisms to disease have in any way narrowed the dominion of cellular pathology. Rather have they extended it. The micro-organisms are themselves cells and what is there in all pathology more distinctly referable to the activities of cells than is the combat between invading micro-organisms and the cells of the body. It matters not for this conception whether the cells of the body in attacking micro-organisms act directly or indirectly by their chemical products. In the latter case their mode of action would be analogous to that of the invading micro-organisms. It is not conceivable that the fluids of the body can possess their power of destroying certain bacteria or their poisons except as they have acquired it from the cells, which control the processes of nutrition.

Cellular pathology is one of those great principles in science which, when established, disclose new points of view, open up limitless fields for investigation, and receive the new results without a tremor in the foundations. How different this from the era of speculative systems and schools of medical doctrine, when every new discovery threatened the overthrow of the dominant system!

With Virchow's return to Berlin, in 1856, he had secured from the government the concession of a new pathological institute, to be constructed according to his own ideas and plans. In any estimate of the reformatory influence of Virchow upon pathology, his share in bringing about the general recognition of the importance of establishing pathological institutes should not be overlooked. In 1858 he wrote: "As in the seventeenth century anatomical theatres, in the eighteenth clinics, in the first half of the nineteenth physiological institutes, so now the time has come to call into existence pathological institutes, and to make them as accessible as possible for all." His ideas as to the general organization of such institutes have been the controlling ones for most of those since constructed in Germany, and for many in other countries. The importance of such institutes for the instruction of students and physicians and for the progress of pathology cannot easily be overestimated. A pathological institute, constructed and conducted like the one in Berlin, requires a very considerable outlay of money, which Virchow said must come in general from the government. In this country, however, we must look in general to private beneficence to endow hospitals and medical schools with such pathological institutes as have made Germany for many years the Mecca of those from other countries who wish to study pathological anatomy.

Virchow, like his teacher, Müller, and like one of his great predecessors in Würzburg, Döllinger, has been one of those teachers who have attracted pupils in large numbers, and have exercised a powerful influence upon their thought and development. The professorships of pathological anatomy in Germany are occupied to a very large extent by those who have been under the inspiration of his personal teachings, and many in other lands are proud to call him master.

Nearly forty years ago, Virchow wrote: "There are also those who, if they do not create the current, still give to it its direction and force. These men are not always the happiest. Many go down in the movement, or by it. Many grow weary after they have given to it their best forces. Much power and great tenacity are necessary if the individual shall not only live to see his triumph, but also to enjoy it."

He who wrote these words has lived to see and to-day enjoys his triumph. May health and happiness be his for many years to come.

III.

Address of Professor Samuel C. Chew, M. D., of the University of Maryland, Baltimore.

I am perhaps too bold in venturing to speak of the achievements of the great medical scholar and worker, whose birth-day we celebrate to-night, in the presence of those who have known him personally and sat under his teachings, while it was never my own privilege to hear his voice or to witness his skill. In my younger days when I was seeking the advantages of professional study in Europe, the medical resources and attractions of Paris were held by my advisers, perhaps erroneously, to be greater than those of Berlin or Vienna. It may be that they were unduly and disproportionately thus regarded. But it so happened that while I listened to some of the latest teachings of Professor Virchow's brilliant contemporary Trousseau,—*Virgilium tantum vidi* (and who that ever heard him can forget that charm of utterance and those stores of learning which combined to make him one of the greatest clinical teachers that ever lived?), yet I have formed acquaintance with the work of the great German master only through his writings. These have indeed made him known wherever in the civilized world medical science is cultivated, and have given him "a name forever." And yet so far apart from many of the usual paths of life does much of the field of medical labor lie, that it is questionable whether very many persons outside of the profession of medicine are aware of the great and multifarious work that he has accomplished. This cannot be considered strange, however, when we reflect upon the indifference, or worse than indifference, with which other earnest workers in medicine have been regarded. Take an instance: The lives saved by the result of Jenner's scientific work are to be counted by thousands of thousands; yes, when the future as well as the past is kept in view, by millions upon millions. And yet a few years ago his countrymen by express decree removed the statue erected to him in London to make room for that of a military hero. Was not this in every sense a monumental instance of ingratitude? "In the corrupted current of this world" such things can be, but in the hereafter at the coming of a better time, when the victor in battles where multitudes have met wounds and agony and death is no longer thought of, the name of Edward Jenner will still shine on brightly and beneficently, "as the stars, forever and ever."

The field of medicine, in its chief divisions of pathological research, clinical observation and therapeutic appliance, is so extensive that it seldom happens that any one worker, however great his ability and his energy, can obtain the highest excellence in all of these departments. The most strenuous and successful students of pathology are often not the most noted diagnosticians or therapeutists; and the converse of this is, of course, equally true. There are, no doubt, some men of genius, the depth of whose knowledge is equalled by their versatility, who seem to have mastered all these branches of medical science. But even with them there is apt to be some inequality of attainment in the different departments, so that their learning in one, though great, may seem lessened by comparison with their supreme accomplishment in another. This state of things may be found in all departments of knowledge or of mental work. In a course of lectures on the Greek Lyric Poets, delivered a few years ago in this University by that eminent scholar Professor Gildersleeve, he expressed the opinion (though I cannot now recall the graceful words in which it was uttered), that the merits of Solon as a poet have failed somewhat of being duly appreciated and of obtaining the recognition to which they are entitled, in consequence of his transcendent reputation as a statesman and legislator; while he was in truth (so far as can be judged from the few fragments of his writings that have come down to us), a notable poet, besides being a great law-giver.

In like manner it may, perhaps, be said of Professor Virchow, that his great achievements as an original investigator in the domain of pathology have caused his work on the clinical side of medicine (a work, in some of its aspects, as different almost from that of the pathologist as is the making of poetry from the making of laws), to be somewhat less regarded than it otherwise would have been, or at least to have had less to do with the establishment of his great reputation. And the distinction thus drawn between his comparative powers and attainments in these different departments of professional work should not occasion surprise. For, though possessed, as was said of Lord Truro of "talents enough to succeed without industry, and of industry enough to succeed without talents," he could not be expected with all his talents and with all his industry, to accomplish an almost superhuman task.

A parallel case, though with a reversal of the conditions, is seen in the history of that brilliant luminary of medical science, Laennec, who will be known through all time as the discoverer—in as real a sense as was Columbus the discoverer of America—of that great instrument of clinical work, the science of auscultation; a science, which, as it issued in almost complete development from his thought, may be justly regarded as one of the most marvelous monuments of the acuteness and power of the human mind. It was as a clinician and for what he supplied to clinical investigation that Laennec won for himself an everlasting fame. And yet it was in reference to his work in pathology that Rokitansky, himself a master in that work, declared that "had Laennec done nothing else for medical science, his discovery of vesicular emphysema" (an important and most interesting affection of the lungs), "and the causes giving rise to it, would have sufficed to render his name immortal."

Laennec was not supreme in the field of pathology only because he was supreme in that of clinical investigation: and so, if Professor Virchow is in any degree short of the very highest place in the domain of clinical medicine, it is because he has made for himself one higher still in that of pathology. And yet even if he had not been the author and founder of the Cellular Pathology, which has made so deep an impression on medical thought, that its traces will be felt so long as disease is studied and those physical troubles last to which "man is born as the sparks fly upward," even then his clinical researches into the subject of leukæmia (made known to the medical world when he was but twenty-four years old), into the subjects of chlorosis, of diphtheria, of pigment induration of the lungs (I trust I may be pardoned by the non-medical portion of my hearers for this technical enumeration), and into many other conditions involving the closest clinical study, would have commanded the admiration of all future generations of medical men.

Quite lately there has been seen an instance of his care and caution as a clinical observer, possessed as he is at a ripe age of that "old experience" which

"doth attain
To something like prophetic strain."

and which, had it been consulted earlier, might have prevented a vast amount of bitter disappointment. I refer to the warning voice which he raised against over-sanguine expectations in the use of the tuberculin.

And perhaps it may not be amiss in further illustration of his caution and conservatism to mention another utterance of his upon a subject beyond the pale of medical science. "You are aware," he said some years ago at the annual meeting at Munich, of German Natural Philosophers and Physicians, "you are aware that I am now specially pursuing the study of anthropology; and I am bound to declare that every advance which we have made in the province of pre-historic anthropology has removed us further from the proof of a connection of man with the animal world. We cannot teach, we cannot pronounce it to be a conquest of science, that man has descended from any other animal." In this famous question he appears, like Lord Beaconsfield, to have placed himself "on the side of the angels." There are some who find a satisfaction in tracing their descent from the primeval jelly; others there are who still think that in their origin and their nature there is something which they share with the angels. "The interpretation of the highest nature is the highest science;" said the great Tory Earl in his famous speech in the Theatre at Oxford: "Man is the highest nature; and when it is the question, 'Is man an ape or an angel?' I, my lord, am on the side of the angels."

The name of Virchow will always be especially associated with the purely scientific part of medicine. In the construction of his great system of pathology he has shown, what has been often witnessed in the higher fields of science, the power and office of the imagination in going before and lighting the way to the greatest discoveries. Those higher regions border closely upon

"The realms of gold
Which bards in fealty to Apollo hold;"

and it was a true instinct of the Greek mind which placed poetry and science under the tutelage of the same divinity.

It was through his imaginative power that Goethe made discoveries of the highest value in anatomy and botany, and foresaw that working of the law of evolution throughout the natural world, which has since his day been more fully revealed. It was through his supreme imagination that Shakespeare could tell how the heart is "visited by its ruddy drops," though Harvey's work was not done until long after those words were written; and by a wondrous anticipation of what was to be revealed at a far later day, even in our own time, could speak in express terms of what we now call septicæmia, when he told how "the life of all the blood is touched corruptibly."

"Had he been one of us," said the spirit in Manfred, "he would have made an awful spirit." And so the votaries of science might say of some great imaginative poet, "had he been one of us, he would have been a mighty power in science." Then there might have been seen another Kepler, another Newton, another Darwin, or another Virchow.

The great pathologist has completed the seventieth year of a life devoted to the good of mankind. "His sun has veered a point towards the west;" but let us hope that many more years of noble work, to be a further boon to humanity and a further honor to the medical calling, are still before him; and that at that distant day when his honored life shall close, he may find his place "on the side of the angels."

IV.

Address of Professor Aaron Friedenwald, M. D., of the College of Physicians and Surgeons, Baltimore.

Thirty years ago it was my good fortune to be a pupil of the great man whom we desire to honor on this occasion. He was then in the prime of life, and had a record which made him the prominent figure among the eminent men of the medical faculty of the University of Berlin. Most of his associates of that period have long since passed away, and younger men, full of enthusiasm and energy, have succeeded them, and all have attained great distinction, but Virchow to-day still remains the acknowledged master. Time has shown neither faltering in his work nor waning in his power. In contemplating the vast activity which he has displayed in the various fields upon which he has brought his giant intellect to bear, and in computing the aggregate of what he has accomplished, we arrive at a result of which the medical profession is justly proud and for which the whole world must be grateful. It is not his work alone, however, nor the discoveries that he has made that challenges our admiration, but it is that stamp of nobility which characterizes his remarkable career throughout, from its brilliant beginning in Berlin, during that time when his genius shone resplendently in Wurzburg, and all through that long and all-important period since his triumphal return to the Prussian Capital. Great as he stands as a scientist, and towering far above all who have worked in the same territory, pre-eminence must be awarded him for his broad interests and brilliant achievements in other domains. Wherever we enter the study of his work, and wherever our thoughts may wander in estimating its full bearing, we inevitably reach a point leading us back to the man himself. He has not moulded with lifeless clay, for in his work there breathes a living soul. He has built well, for what he has built has stood the test of time, and he has built so that others could build thereon. Besides the merit of his own gigantic work, we cannot fail to take into account, in estimating the benefit he has been to science, the good work done by others through his inspiration. Pathology, through his touch, received a regeneration, and what it has become since he entered its field is largely due to his contributions and his influence. If he had done nothing else, this alone would entitle him to be placed side by side with the greatest men of any time. But his genius required greater scope. In anthropology he has become an acknowledged authority, and he seems to be as fully at home in the one as in the other great branch of science. All the expenditure of energy which these labors demanded did not overtax our hero. He had sufficient force in reserve to enable him to acquire great distinction in quite a different field. The speeches which he made to the workingmen of Berlin in '48 were not the ephemeral emanations of a wild young brain. They indicated the deep convictions that governed the man in his start in life, and which remained an inseparable part of him when he reached high position and his genius had been universally acknowledged. His keen eye, which saw disease in the human body as it seldom was seen before, did not fail to detect what was morbid in the body politic. The clearness with which he was able to demonstrate his classical autopsies, the brilliancy of his general lectures, the instructive lessons that followed those microscopes as they moved along the little railway before his class, have their analogy in the demonstrative, brilliant and instructive character which marks his activity in legislative bodies. He has been no inconsiderable factor in that movement which has made Berlin the model municipality. In all the great questions which have occupied the German Parliament, his voice was heard and had to be listened to. True as he has always been to the interests of the medical profession, devoted as he has remained through life to science in general, he has ever been equally loyal to his convictions. A man like Virchow must necessarily at times be aggressive. To establish a fact often involves a combat with those who advocate an error, and in showing up a wrong, the wrong-doer cannot always be spared. He never failed in the moral courage demanded by his duty. In the earliest part of his career as a pathologist, he bade defiance against having pathology made the "Rumpel Kammer" of medicine, and there was no authority so great with which he would leave secure the statement of an error. This moral courage stood by him in '48, and characterized his attitude when he had to meet, in intellectual combat, "the man of blood and iron."

The medical profession rejoices in claiming such a member, Germany can point with pride to such a son, the world must feel blessed with such a citizen.

V.

Address of Professor Abraham Jacobi, M. D., of the College of Physicians and Surgeons, New York City.

You have received more information to-night than I could give, and in choicer words than I can muster. Indeed, to do justice to the subject of our entertainment, I ought to have a degree of eloquence which I do not possess. Thus I beg to apologize for your chairman, whose fault it is—for it is not mine—that I am not permitted to spare you.

What we have to admire in Rudolph Virchow is, beyond everything else, his comprehensive universality of studies and aims. There appears to be nothing that is human to which he is a stranger. He has studied and fathomed a great many things, and has always done not only his best, but the best. In the domain of sciences he has been a varied specialist. His most splendid achievements were from the beginning on the field of pathological anatomy. Indeed, modern pathological anatomy—with all due credit to the French, who created the scientific medicine of the first four decades of this century, and to the Vienna school which followed them—is his work. That is a fact with which medical men who know the history of our science in the last fifty years are well acquainted. His revelations referring to embolism, leucocythæmia, chlorosis and tumors were but the glorious forerunners of his cellular pathology which has created a new basis for all of our modern views in pathology and therapeutics. These special studies, however, were always undertaken with a philosophical and humanitarian spirit. When quite a young man, his ideas went far beyond the dissecting table. His reports on the typhus epidemics of Siberia and the Rhoen Mountains breathe the spirit which sighs for and loves mankind, and made an immense impression on the people at large. All his studies were directed, beyond eliciting new facts and evolving new theories, to enhancing the welfare of the race in general. Always did he insist upon this—that all science and every scientific effort must be able to be finally utilized for the common good. It is also from this point of view that he was a revolutionist and a leader of revolutionary thought during 1848, and never ceased to take part in the political exertions of the people in the direction of a liberal evolution of the institutions of Germany. Not only did this sense of duty prevail upon him to labor in Parliament for the rights of the masses, in opposition to an absolutistic government and the violence of a tyrannical and self-seeking chancellor, but his time and labor were spent on the duties of an alderman of his city these two dozen years. The sanitary improvements of Berlin, and the impulse given by them to all the cities of Germany and beyond, are mainly the results of his knowledge and his personal efforts. Thus all his theoretical studies were at once fertilized in the practical interest of mankind. He wrote a book on the necessity of unifying the medical sciences, and he lived a life proving the union of all human interests. In his scientific researches, each of which would have been sufficient to make the reputation of a great and gifted man, he did not, however, limit himself to medicine proper; what he has added to our knowledge on archæology and anthropology belongs to the very best any great specialist could have furnished to swell our stock of scientific possessions. Thus the universality of his genius and the immensity of his working faculties are quite unique. Perhaps there is but one man in history whose name is to be mentioned with the same veneration—that is Aristotle, who also was the expert in natural history, philosophy and philosophical history and politics. But the knowledge of the ancients was limited, and its boundaries more easily reached. At present but few are so gifted as to embrace more than one or a few branches of scientific knowledge or research.

In all Virchow has labored for, there is the tendency of accomplishing a philosophical end, and of establishing a solidarity of all sciences and interests. His is no longer anatomical, or medical, or political science, but science. His aim is man and his improvement. Nor was his work ever national; his science is not German, it is human, humanitarian, international, cosmopolitan. It is greatly through his efforts that the best men of all nations no longer speak of German, or French, or Anglo-Saxon Science, but of Science only. On that field fraternization has commenced in earnest. The specialism of science finds its final and hoped for solution in universalism, nationalism, in cosmopolitanism. Thus science, with its broadening influence, will precede the development of cosmopolitanism of the human race, which appears to spend this whole century on gathering and conglomerating nationalities preliminarily to the future, which is fervently expected to evolve into fraternizing cosmopolitan communities. This is the tendency which, up to the present time, finds its best expression in the republican institutions and the hospitable customs of America. Thus it is most fitting that an American University of the first rank should have undertaken to celebrate the seventieth birthday of the very man who has contributed more than any other, first to develop, then to *de*specialize and *de*nationalize both scientific and humanitarian efforts. I have to thank your leaders for the invitation to be present, and do so from all my heart. It is becoming that we Americans should celebrate this day. For that man has worked persistently, unselfishly, gloriously—never for himself—always in the common interest of all mankind. Thus we pay homage, not to a stranger, but to one of ourselves.

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